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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/141,287	08/27/98	WU H	30-4540-4780

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EXAMINER	
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ART UNIT	**PAPER NUMBER**
2813	6

DATE MAILED: 06/22/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/141,287	Wu et al.
Examiner	**Group Art Unit**
Matthew Whipple	2813

☒ Responsive to communication(s) filed on *Aug 27, 1998* .

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1-31* is/are pending in the application.

Of the above, claim(s) *30 and 31* is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1-29* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____ .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____ .

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). *5*

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Election/Restriction

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claim 1-29, drawn to a method of forming a coating, classified in class 438, subclass 622.

   II. Claims 30-31, drawn to a product, classified in class 257, subclass 632.

2. The inventions are distinct, each from the other because of the following reasons: Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by another process, such as by forming the aerogel film an then bonding it to the semiconductor substrate or heating the substrate in an inorganic atmosphere, such as supercritical carbon dioxide.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Richard Roberts on 4/6/99 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-29. Affirmation of this

election must be made by applicant in replying to this Office action. Claims 30-31 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention. Note that in the original telephone restriction Group I was additionally broken into several species. However, the examiner elected to examine all the process claims together.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

7. Claims 1-9 and 13-29 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. patent 5,736,425 (Smith et al.).

Smith et al. teach applicant's claimed process, including forming a substantially uniform alkoxysilane gel composition by combining TEOS, ethylene glycol, ethanol. water and ammonium

hydroxide catalyst (see col. 10, lines 52-67 and Figure 8B). The gel composition is then aged in an organic atmosphere of nearly saturated ethylene glycol (col. 11, lines 20-40) which would inherently act to condense the gel composition because it is the same as applicant's disclosed heating step (see applicant's disclosure, page 8, lines 12-20). Note that when the reference speaks of preventing condensation it is talking about condensation from the vapor atmosphere, not condensation of the gel film (col. 4, lines 45-47). The film is than dried (cured). Ethylene glycol has a boiling point of 197° C (see Hawley's chemical dictionary) and ethanol is lower than 120° C. The alkoxysilane would be exposed to water vapor and base vapor because every liquid has a certain vapor pressure for any temperature and pressure and further because the water solution was refluxed above the boiling point of water (col. 10, line54). The liquid TEOS mixture is dispensed onto the substrate and spun. Dielectric constants are taught at col. 6, lines 10-15. Metal lines and a silicon substrate are taught at col. 10, lines 37-45. HMDS as a surface treating agent and hydrophobicity is taught at col. 14, lines 35-40.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al..

Smith et al. is applied as above, but does not expressly mention a combined stream, as in claims 10-12.

However, the examiner gives Official Notice that dispensing to spin a liquid is known and obvious to be done by pouring the liquid in a stream onto the substrate.

Further, if HMDS and hydrophobicity are not considered anticipated, then they are obvious, in view of the disclosure of Smith et al..

Double Patenting

10. Claims 1-29 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-53 of U.S. Patent No. 5,736,425 or claims 1-39 of U.S. Patent 5,807,607. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims read in light of the disclosure make applicant's claimed invention obvious, similarly as discussed in the rejections above.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 5,494,858 (Gnade et al.) teach gellation and aging in a saturated ethanol atmopshere (col. 5, lines 1-5). Also see EP0775669 (in IDS) and U.S. 5,368,887 (Hoshino) at col. 2, lines 50-55.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Whipple whose telephone number is (703) 308-2521.

Charles Bowers
Supervisory Patent Examiner
Technology Center 2800

MLW

June 17, 1999